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METEOROLOGICAL SUMMARY FOR THE YEAR 1881.

(From observations taken at Lawrence.)

BY PROF. F. H. SNOW, OF THE STATE UNIVERSITY OF KANSAS.

The most marked meteorological features of the year were the severe and prolonged winter; the extremely late spring; the excessive and long-continued heat of the summer, extending even into October; the delay of the first severe frost of autumn until nearly the middle of November, resulting in the unseasonable blossoming of many fruit and flowering trees and shrubs; and the unusual warmth and fine weather of December. The total rainfall was nearly equal to the average amount. The rain deficiency in July and August reduced the corn crop to about half the average yield, but the consequent high prices have in most cases more than compensated for the reduction.

TEMPERATURE.

Mean temperature of the year, 54.65° , which is 1.31° above the mean of the thirteen preceding years. The highest temperature was 104° , on August 11th and 25th; the lowest was 8° below zero, on the 9th of January, giving a yearly range of 112° . Mean at 7 A. M., 48.87° ; at 2 P. M., 63.52° ; at 9 P. M., 53.12° .

Mean temperature of the winter months, 29.16° , which is 0.92° below the average winter temperature; of the spring, 53.27° , which is 0.74° below the average; of the summer, 79.41° , which is 3.02° above the average; of the autumn, 56.75° , which is 3.86° above the average.

The coldest month of the year was January, with mean temperature 21.60° ; the coldest week was January 8th to 14th, with mean temperature 14.45° ; the coldest day was January 9th, with mean temperature 1.5° below zero. The mercury fell below zero six times during the year—three times in January, and three times in February.

The warmest month was August, with mean temperature 81.23° ; the warmest week was July 5th to 11th, with mean temperature 85.09° ; the warmest day was August 17th, with mean temperature 89.7° . The mercury reached or exceeded 100° on fourteen days, of which three were in July and eleven in August; the mercury reached or exceeded 90° on sixty-eight days, viz., nine in June, eighteen in July, twenty-six in August, fourteen in September, and one in October.

The last light frost of spring was on April 15th; the first light frost of autumn was on September 25th, giving an interval of 193 days (more than six months) entirely without frost. The last severe frost of spring was on April 13th; the first severe frost of autumn was on November 9th, giving an interval of 210 days (nearly seven months) without severe frost. No

frost during the year damaged fruit buds or trees, but winter wheat was injured in some localities by the severe cold of the first half of April.

RAIN.

The entire rainfall, including melted snow, was 33.27 inches, which is slightly above the precipitation of 1879 and 1880, but 1.31 inches below the average rainfall of the thirteen preceding years. Either rain or snow (or both) fell on 110 days—seven more than the average. On nine of these days the quantity was too small for measurement. The longest interval without rain during the growing season (March 1st to October 1st) was fourteen days—from July 29th to August 12th. The number of thunder showers was thirty-one. There were three hail storms, of which one occurred in April and two in September. The hail of September 29th were very large and destructive.

SNOW

The entire depth of snow was 32.50 inches, which is 12.06 inches above the average. Of this amount, half an inch fell in January, twenty-two inches in February, one inch in November, and one inch in December. The last snow of spring was on April 12th; the first snow of autumn was on November 18th.

FACE OF THE SKY.

The average cloudiness of the year was 47.52 per cent., which is 3.43 per cent. above the average. The number of clear days (less than one-third cloudy) was 157; half-clear days (from one-third to two-thirds cloudy), 95; cloudy (more than two-thirds), 113. There were 79 days on which the cloudiness averaged 80 per cent. or more. There were 37 entirely clear, and 55 entirely cloudy days. The clearest month was July, with a mean of 26.23 per cent.; the cloudiest month was May, with a mean of 64.08 per cent. The mean cloudiness at 7 A. M., was 52.56 per cent.; at 2 P. M., 50.25 per cent.; at 9 P. M., 39.75 per cent.

DIRECTION OF THE WIND.

During the year, three observations daily, the wind was from the N. W. 280 times; S. W., 276 times; S. E., 139 times; S., 110 times; N. E., 116 times; E., 95 times; N., 72 times; W., 6 times; calm, once. The south winds (including southwest, south and southeast) outnumbered the north winds—including northwest, north and northeast—in the ratio of 525 to 468.

VELOCITY OF THE WIND.

The number of miles traveled by the wind during the year was 141,430, which is 3,383 miles above the annual average for the eight preceding years. This gives a mean daily velocity of 387.48 miles, and a mean hourly velocity of 16.14 miles. The highest velocity was 60 miles an hour, on February 11th and March 31st. The highest daily velocity was 1,010 miles, on March 4th; the highest monthly velocity was 16,231 miles, in March. The three windiest months were March, April and November; the three calmest months

were May, July and August. The average velocity at 7 A. M., was 14.48 miles; at 2 P. M., 17.51 miles; at 9 P. M., 15.46 miles.

BAROMETER.

Mean height of barometer column, 29.103 inches; at 7 A. M., 29.125 inches; at 2 P. M., 29.081 inches; at 9 P. M., 29.104 inches. Maximum, 29.722 inches, on January 26th; minimum, 28.305 inches, on March 11th; yearly range, 1.417 inches. The highest monthly mean was 29.255 inches, in January; the lowest was 28.769 inches, in June. The barometer observations are corrected for temperature and instrumental error.

RELATIVE HUMIDITY.

The average atmospheric humidity for the year was 70.12; at 7 A. M., 80.14; at 2 P. M., 53.36; at 9 P. M., 76.88. The dampest month was February, with mean humidity 79.8; the driest month was September, with mean humidity 60.76. There were eleven fogs during the year. The least humidity for any single observation was 16.1, at 2 P. M. on the 24th of September—less than one-sixth of saturation.

The following table gives the mean temperature, the extremes of temperature, the velocity of the wind, the percentage of cloudiness, the relative humidity, the rainfall (including melted snow), and the depth of snow, for each month of the year 1881.

1880.	Mean temper- ature.	Max. temper- ature.	Min. temper- ature.	Miles of wind.	Relative humidity.	Rain, inches.	Snow, inches.	Mean cloudi- ness.
January.....	21.60	53.0	*-8.0	12,192	75.90	0.34	0.5	58.60
February.....	25.78	61.5	-5.5	12,142	79.80	4.60	22.0	54.17
March.....	37.47	77.0	14.0	16,231	70.30	1.66	8.0	45.79
April.....	52.47	84.0	13.0	14,495	67.60	1.27	.....	51.78
May.....	69.86	88.5	48.0	8,868	72.47	3.51	.....	64.08
June.....	77.25	97.0	62.5	11,474	70.10	4.52	.....	31.89
July.....	79.74	102.0	57.5	7,541	72.50	2.28	.....	26.23
August.....	81.23	104.0	62.0	7,991	62.50	1.57	.....	31.29
September.....	70.59	99.0	42.5	11,722	60.76	5.72	.....	43.89
October.....	59.27	91.0	39.5	12,189	74.25	4.35	.....	61.72
November.....	40.40	71.5	11.0	13,906	66.99	2.55	1.0	45.55
December.....	40.10	63.0	18.0	12,679	68.80	0.90	1.0	55.26
Mean.....	54.65	82.6	31.1	11,786	70.12	2.77	2.7	47.52

*The minus sign denotes temperature below zero.

NOTES ON KANSAS MINERALS.

BY ERASMUS HAWORTH, EMPIRE CITY, KANSAS.

The following minerals, *new to Kansas*, have been found in Cherokee county:

1. Native sulphur. 2. Chalcopyrite (copper pyrites). 3. Greenockite (cadmium sulphide). 4. Anglesite (lead sulphate).

1. Native sulphur occurs at Weir City, and in other coal-mining districts. The "dumps" at the coal shafts take fire spontaneously, and the heat decomposes a portion of the iron pyrites, the sulphur from which is volatilized, and